IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Gordon E. Hardman et al.	)	Attorney Docket No. 295620214063
Application No.: 09/916,028	)	
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For: ELECTRONIC TIRE MANAGEMENT SYSTEM	)	
Examiner: Phung Nguyen	)	
Art Unit: 2632	)	
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AMENDMENTS TO THE CLAIMS

Claim 1 (Currently Amended) A system for measuring a parameter of a device ~~at a first location~~ comprising:

a sensor for measuring the device parameter and generating a data signal representing the measured parameter;

a microprocessor coupled to the sensor for activating the sensor on a first periodic basis to measure the device parameter;

a memory in the microprocessor for storing the generated data signal representing the measured parameter;

a transmitter coupled to the microprocessor; and

a receiver coupled to the microprocessor, the microprocessor periodically partially awakening to determine, on a second periodic basis, if a received transmission is a valid interrogation signal and, if so, fully awakening and responding to the valid interrogation signal, via the transmitter, by at least transmitting the last stored measured parameter.

Claim 2 (Original) The system of claim 1, wherein the device is a tire tag disposed inside of a vehicle tire, the system further comprising:

a printed circuit board (PCB) disposed within the vehicle tire, the PCB including first antenna terminals, the sensor, the microprocessor, the memory, and the transmitter;

an antenna displaced from the PCB and including second antenna terminals, the first and second antenna terminals being configured to electrically connect with each other to thereby electrically connect the antenna to the transmitter; and

potting material for encapsulating the PCB, the sensor, the microprocessor, the memory, the transmitter, and the antenna.

Claim 3 (Original) The system of claim 2, wherein the antenna is a monopole antenna.

Claim 4 (Original) The system of claim 2, wherein the antenna is a dipole antenna.

Claim 5 (Original) The system of claim 2, wherein the antenna is attached to the PCB such that the antenna is in a plane parallel to and slightly spaced from the plane of the printed circuit board.

Claim 6 (Original) The system of claim 2, wherein the antenna is integral with the PCB.

Claim 7 (Original) The system of claim 2, wherein the antenna is attached to the PCB such that the antenna is in a plane normal to the plane of the printed circuit board.

Claim 8 (Original) The system of claim 2, wherein the antenna is spaced from the PCB.

Claim 9 (Original) The system of claim 2, wherein the tire tag further includes:

a tire patch for attaching the tire tag to an inside wall of the vehicle tire, the tire patch having a base for adhering to the inside wall of the vehicle tire, and

a mesa extending above the tire patch base; the tire patch mesa being constructed to securely attach the tire tag to the tire patch and to assist in isolating the tire tag from tire stresses and vibration.

Claim 10 (Original) The system of claim 9, further comprising:

a potting material encapsulating the tire tag, the potting material having a periphery;

a leg extending inwardly around the periphery of the potting material and forming a recess; and

a shoulder extending outwardly from a periphery of the tire patch mesa and being received in the recess of the potting material, the shoulder including a generally horizontal lip for abutting the leg of the potting material to securely attach the encapsulated tire tag to the tire patch.

Claim 11 (Original) The system of claim 10, further comprising:

an arcuate concave recess below the tire patch shoulder, the arcuate concave recess enabling air to be removed from under the tire patch when affixing the tire patch to the tire.

Claim 12 (Original) The system of claim 2, further comprising:

an orifice in the potting material to enable air inside the tire to reach the pressure sensor; and

a hydrophobic filter associated with the orifice to prevent fluid from reaching the pressure sensor.

Claim 13 (Original) The system of claim 1, wherein the operating frequency for the system is in the ISM frequency band.

Claim 14 (Currently Amended) The system of claim 1, further comprising a reader/transceiver (RT) at a remote ~~the second~~ location for receiving sensor data from the device and transmitting command signals to the device, the RT including a memory for storing the received sensor data.

Claim 15 (Original) The system of claim 14, wherein the RT is a portable reader.

Claim 16 (Original) The system of claim 14, wherein the RT is a fixed gate reader.

Claim 17 (Original) The system of claim 14, wherein the RT is surveillance reader.

Claim 18 (Original) The system of claim 14, wherein the RT is an on-board vehicle reader.

Claim 19 (Original) The system of claim 14, wherein the device is mounted within a vehicle tire and measures parameters including pressure and temperature.

Claim 20 (Original) The system of claim 1, wherein the device is a tire tag that includes:

a deep sleep mode in which no clock is running but an internal R/C oscillator is incrementing a deep sleep counter which provides periodic wake-up signals at predetermined intervals;

a lucid sleep mode wherein the microprocessor partially awakens, initiates a low-speed clock, and determines if it is time to enter a search mode;

a search mode that continues using the low-speed clock, reads data from the sensor, if it is time for such a reading, and examines the received transmission to determine whether the transmission is a possible interrogation signal; and

an interrogation mode that is entered when the received transmission is a possible interrogation signal, and that initiates a high-speed clock, examines the interrogation signal to see if it is valid, and responds to the valid interrogation signal.

Claim 21 (Original) The system of claim 20, wherein the microprocessor, in the search mode, determines if it is time to read sensor data by examining a sensor counter

Claim 22 (Original) The system of claim 20, wherein the microprocessor, in the search mode, determines if it is time to perform an autonomous transmission (AT).

Claim 23 (Original) The system of claim 22, wherein the microprocessor, in the interrogation mode, determines whether the interrogation signal is valid by examining a portion of the interrogation signal and, if the portion of the interrogation signal appears to be a valid interrogation signal, reads the rest of the interrogation signal to verify that the interrogation signal is valid, and then responds thereto.

Claim 24 (Currently Amended) The system of claim 1, wherein the microprocessor on a third periodic basis autonomously transmits an alarm signal to at least one remote reader/transceiver (RT) ~~at the second location~~ only when the last stored measured parameter falls outside of a predetermined threshold.

Claim 25 (Original) The system of claim 1, wherein the device is a tire tag disposed inside of a vehicle tire, the system further comprising:

a reader/transceiver (RT) remote from the tire tag, the RT transmitting forward link packets to the tag receiver; and

a reader processor (RP) remote from the tire tag, the RP receiving return link packets from the RT and identifying the transmitting tire tag from data in the return link packets.

Claim 26 (Original) The system of claim 25, wherein the RT is capable of interrogating the tire tag to obtain data including at least temperature and pressure.

Claim 27 (Original) The system of claim 25, wherein the RT is capable of interrogating the tire tag to obtain data including number of vehicle tire rotations.

Claim 28 (Original) The system of claim 25, wherein the RP identifies the transmitting tire tag on the basis of a functional identification number that is transmitted by the tire tag.

Claim 29 (Original) The system of claim 25, wherein the RP identifies the transmitting tire tag on the basis of a unique tire tag serial number that is transmitted by the tire tag.

Claim 30 (Original) The system of claim 25, wherein the RP identifies the transmitting tire tag using a successive approximation routine (SAR).

Claim 31 (Original) The system of claim 30, wherein the SAR includes comparing a masked comparator value having a certain number of bits to the serial number of the tag.

Claim 32 (Original) The system of claim 31, wherein the SAR further includes sequentially incrementing a mask value by one to reveal another bit of the masked comparator value.

Claim 33 (Original) The system of claim 32, wherein the SAR further includes comparing the modified masked comparator value with the serial number of the tag until there is a match.

Claim 34 (Original) The system of claim 25, wherein the tire tag transmitter and the RT operate in the ISM frequency band.

Claim 35 (Currently Amended) The system of claim 1, wherein the device is a tire tag, the system further comprising:

a remote reader/transceiver (RT) ~~at the second location~~ for receiving data signals from the tire tag transmitter and transmitting command signals to the tire tag receiver; and

a frequency hopping circuit for causing the RT to transmit each command signal on a frequency different from the previous command signal to avoid interference with other devices operating in the same bandwidth.

Claim 36 (Original) The system of claim 1, further including a remote computer at a third location for receiving data from the second location via a communication channel.

Claim 37 (Original) The system of claim 36, wherein the communication channel is selected from the group consisting of a wire link, wireless link, RF link, cable link, microwave link, satellite link, optical link, LAN link, Internet link, and Ethernet link.

Claim 38 (Original) The system of claim 1, further including a tire patch mounted on the inside of a vehicle tire, wherein the tire tag is encapsulated in an epoxy and attached to tire patch.

Claim 39 (Original) The system of claim 38, wherein the tire patch is disposed on a sidewall of the vehicle tire.

Claim 40 (Original) A system for measuring a tire parameter comprising:

a tire tag disposed inside of a vehicle tire, the tire tag including:

a sensor for measuring one or more tire parameters;

a microprocessor coupled to the sensor for activating the sensor on a first periodic basis;

a memory in the microprocessor for storing the one or more tire parameters;

a transmitter coupled to the microprocessor; and

a receiver coupled to the microprocessor, the microprocessor periodically partially awakening to a search mode, determining, on a second periodic basis, if a transmission is likely an interrogation signal and, if so, further awakening to an interrogation mode, determining if the transmission is a valid interrogation signal and, if so, responding to the valid interrogation signal, via the transmitter, by at least transmitting the last stored data signal representing the measured parameter.

Claim 41 (Original) The system of claim 40, further comprising:

a reader/transmitter (RT) at the remote location for receiving data signals from and transmitting command signals to the tire tag;

a reader processor (RP) for interpreting the data signals; and

a computer for communicating with the RP and enabling a user to access data from the tire tag.

Claim 42 (Original) The system of claim 41, wherein the computer is a remote computer for storing the tire parameters.

Claim 43 (Original) The system of claim 41, wherein the computer is a field support computer that enables a user to interact with the RT and the RP.

Claim 44 (Original) The system of claim 41, wherein the RP and the RT are both at the remote location.

Claim 45 (Original) The system of claim 41, wherein the RP and the RT are at different remote locations.

Claim 46 (Original) The system of claim 41, wherein the RT is an on-board vehicle reader.

Claim 47 (Original) The system of claim 41, wherein a RT is provided on each side of a vehicle, each RT unit communicating with one or more tire tags on the same side of the vehicle on which the RT unit is located.

Claim 48 (Original) The system of claim 41, wherein the RT is a surveillance reader.

Claim 49 (Original) The system of claim 48, wherein the surveillance reader primarily listens for transmissions from the tire tag.

Claim 50 (Original) The system of claim 41, wherein the RT is a portable reader.

Claim 51 (Original) The system of claim 41, wherein the RT is a fixed gate reader.

Claim 52 (Original) The system of claim 51, further comprising:

a database remote from the fixed gate reader; and

a data transmission device associated with the fixed gate reader for transmitting the most recently stored tire parameters to the database.

Claim 53 (Original) The system of claim 41, wherein the tire tag is a self-powered unit.

Claim 54 (Original) The system of claim 41, wherein the RT interrogates the tire tag for the most recently stored tire parameters.

Claim 55 (Original) The system of claim 41, wherein the reader processor identifies the transmitting tire tag using a successive approximation routine (SAR).

Claim 56 (Original) The system of claim 55, wherein the SAR includes identifying a tire tag by a serial number.

Claim 57 (Original) The system of claim 56, wherein the SAR uses a command and response algorithm that compares a masked comparator value having a certain number of bits to the serial number of the tag.

Claim 58 (Original) The system of claim 57, wherein the SAR further includes sequentially incrementing a mask value by one to reveal another bit of the masked comparator value until the masked comparator value equals the serial number of the tag.

Claim 59 (Original) The system of claim 41, further comprising a communication link between the RT and the computer that allows a user to upload tag data stored in the RT to the computer.

Claim 60 (Original) The system of claim 59, wherein the communication link is selected from the group consisting of a wire link, wireless link, RF link, cable link, microwave link, satellite link, optical link, LAN link, Internet link, Ethernet link, and an RS-232 serial link.

Claim 61 (Original) The system of claim 41, wherein the computer is a personal computer (PC) running appropriate software to maintain a database of tag data.

Claim 62 (Original) The system of claim 61, wherein the database includes an archive of tag history data.

Claim 63 (Original) The system of claim 41, wherein the RT transmits a command to the tire tag and then waits a predetermined period of time for a response.

Claim 64 (Original) The system of claim 41, wherein:

the RT includes a plurality of forward link channels on which to send command signals to the RT;

the tag transmitter includes a plurality of return link channels on which to transmit data signals to the RT; and

the tag uses each return link channel sequentially to respond to each command signal from the RT.

Claim 65 (Original) The system of claim 64, wherein:

the forward link channels use amplitude shift key (ASK) modulation; and

the return link channels uses frequency shift key (FSK) modulation.

Claim 66 (Original) The system of claim 64, wherein:

the data rate of the command signals is about 7.5 Kbps; and

the data rate of the data signals is about 60 Kbps.

Claim 67 (Original) The system of claim 41, wherein the RT transmits a command signal to the tire tag assigning a temporary ID number to the tire tag.

Claim 68 (Original) The system of claim 41, wherein the tire tag includes an autonomous transmission mode that, at preset intervals, causes the tire tag to awaken and transmit the last stored sensor measurements to the RT, and then returns to a deep sleep mode, all without external activation.

Claim 69 (Original) The system of claim 41, wherein the tire tag includes an alarm function that, at preset intervals, awakens the tire tag, examines the last stored tire parameters, determines if an alarm condition exists, and, if an alarm condition exists, transmits an alarm signal to the RT, all without external activation.

Claim 70 (Original) The system of claim 69, wherein the tire tag terminates the alarm signal transmission upon receipt of an acknowledgement from the RT.

Claim 71 (Original) The system of claim 69, wherein the tire tag rearms the alarm function when the alarm signal transmission is terminated.

Claim 72 (Original) The system of claim 69, wherein the alarm condition is determined by comparing the most recently stored tire parameters with stored threshold values.

Claim 73 (Original) The system of claim 69, wherein the alarm signal is transmitted if one of the tire parameters is outside of the stored threshold values.

Claim 74 (Original) The system of claim 41, wherein the tire tag further comprises a kill tag function that allows a command from the RT to erase all data stored in the tag memory such that the tire tag will not respond to any external commands.

Claim 75 (Original) The system of claim 41, wherein the tag further includes a first low power internal oscillator for generating a first clock signal.

Claim 76 (Original) The system of claim 75, wherein the first low power clock signal is used for incrementing a sleep register for determining when to exit a deep sleep mode.

Claim 77 (Original) The system of claim 75, wherein the first low power clock signal is used for operating the tag in the search mode.

Claim 78 (Original) The system of claim 41, wherein the tag further includes a second internal oscillator for generating a second clock signal.

Claim 79 (Original) The system of claim 78, wherein the second clock signal is used for operating the tag in the interrogation mode.

Claim 80 (Original) The system of claim 41, wherein the tire tag includes a tire history function that only downloads tire history data not previously downloaded to the RT.

Claim 81 (Original) The system of claim 41, wherein the tire tag includes a tire history function that downloads all of the tire history data stored in the tire tag to the RT.

Claim 82 (Original) The system of claim 41, wherein:

the RT sends command signals to the tire tag instructing the tire tag to transmit the contents of selected memory locations in the tag memory to the RT; and

the RT sends command signals instructing the tire tag to enter a deep sleep mode after the contents of the selected memory locations have been transmitted to the RT.

Claim 83 (Original) The system of claim 40, wherein the tire tag further comprises an erase function that erases all stored user level data and returns the tire tag to manufacturer level defaults.

Claim 84 (Original) The system of claim 40, wherein the tire tag includes an autonomous data collection function that, at preset intervals, awakens the tire tag, takes sensor measurements, stores the sensor measurements, and returns to a deep sleep mode, all without any external activation.

Claim 85 (Original) The system of claim 40, wherein the tire parameters include one or more of tire pressure, tire temperature, a unique serial number, and tire history data including tire pressure and tire temperature data stored over a predetermined period of time.

Claim 86 (Original) The system of claim 40, wherein the tire tag includes a write function that enables a user to write data into the tire tag memory, including the wheel position of the tire tag, the vehicle number, the threshold tire pressure values, the threshold tire temperature values, user defined data, and calibration coefficients for the sensor.

Claim 87 (Original) The system of claim 40, wherein the data signals received from the tire tag include tag history data.

Claim 88 (Original) The system of claim 40, wherein the tire tag includes password protection to prevent unauthorized users from accessing the tire tag.

Claim 89 (Original) The system of claim 40, wherein the measured tire parameters include one or more of tire pressure and wherein the tire tag further comprises a turn-off function that enables the tag to recognize when the measured tire pressure is within a preselected pressure

threshold and, while the pressure is within the preselected threshold, to cease storing and transmitting tag data to conserve power.

Claim 90 (Original) The system of claim 40, wherein the tire tag memory stores data including one or more of tire type, tire position on a vehicle, vehicle ID, tire ID, and number of tire revolutions.

Claim 91 (Original) The system of claim 40, further including a spread-spectrum forward link including at least 50 channels.

Claim 92 (Original) The system of claim 40, wherein the tag includes different modes of operation, including a sleep mode, to conserve power.

Claim 93 (Original) The system of claim 40, wherein the tag includes different clock speeds for performing different functions to conserve power.

Claim 94 (Original) The system of claim 40, further including a tire patch mounted on the inside of a vehicle tire, wherein the tire tag is encapsulated in an epoxy and attached to tire patch.

Claim 95 (Original) The system of claim 94, wherein the tire patch is disposed on a sidewall of the vehicle tire.

Claim 96 (Original) The system of claim 40, wherein the valid interrogation signal includes a postamble comprised of a stream of logical zeros.

Claim 97 (Original) The system of claim 40, wherein the valid interrogation signal includes a postamble beginning with a stream of logical zeros and ending with a logical one.

Claim 98 (Original) The system of claim 97, wherein the transition from logical zero to logical one signifies the end of the valid interrogation signal.

Claim 99 (Original) The system of claim 97, wherein the postamble increases the amount of time between the interrogation signal and a response from the tire tag, allowing the tire tag enough time to stabilize its transmitter on an appropriate return link channel.

Claim 100 (Original A tire tag comprising:

a sensor for measuring at least one tire parameter;

a microprocessor for causing the tire tag to enter a deep sleep mode in which a minimum number of electrical components are powered to conserve battery power;

the microprocessor, on a periodic basis, enabling only the electrical components necessary to enter a lucid sleep mode, initiate a low-speed clock, and determine if it is time to enter a search mode;

a receiver coupled to the microprocessor;

the microprocessor, on a periodic basis, enabling only the electrical components necessary to enter a search mode, use the low-speed clock, read data from the sensor, if it is time for such a reading, determine if a transmission received by the receiver is likely an interrogation signal from a reader/transceiver (RT) and, if so, enable all of the necessary electrical components required to enter an interrogation mode and initiate a high-speed clock.

Claim 101 (Original) The system of claim 100, wherein the microprocessor, in the search mode, determines if it is time to perform an autonomous transmission (AT).

Claim 102 (Original) The system of claim 100, wherein the microprocessor, in the interrogation mode, determines whether the transmission is a valid interrogation signal and, if so, responds thereto.

Claim 103 (Original) The system of claim 102, wherein the microprocessor determines whether the transmission is a valid interrogation signal by examining a portion of the

transmission and, if the portion of the transmission appears to be a valid interrogation signal, reading the rest of the transmission to verify that the transmission is a valid interrogation signal.

Claim 104 (Original) The system of claim 103, wherein the microprocessor responds to the valid interrogation signal by transmitting the last stored sensor data.

Claim 105 (Original) The system of claim 100, wherein the tire tag remains in the search mode looking for likely interrogation signals for a first predetermined period of time and then returns to the deep sleep mode for a second predetermined period of time.

Claim 106 (Original) The system of claim 100, wherein the microprocessor includes two internal oscillators for producing the low-speed clock for operating the tire tag in the lucid sleep mode and the search mode, and the high-speed clock for operating the tire tag in the interrogation mode.

Claim 107 (Original) A system for measuring a parameter of a device comprising:

a sensor for measuring the device parameter and generating a data signal representing the measured parameter;

a memory in the microprocessor for storing the generated data signal representing the measured parameter;

a microprocessor coupled to the sensor for activating the sensor on a first periodic basis to measure the device parameter, the microprocessor comparing the measured parameter with one or more parameter thresholds and generating an alarm signal if the measured parameter is outside of the one or more parameter thresholds; and

a transmitter coupled to the microprocessor for transmitting the alarm signal on a second periodic basis to a remote reader/transceiver (RT) without external activation.

Claim 108 (Original) The system of claim 107, wherein the microprocessor partially awakens, takes (on the first periodic basis) sensor measurements, stores the sensor measurements, checks for alarm conditions, and returns to a deep sleep mode, all without any external activation.

Claim 109 (Original) The system of claim 107, wherein the device is a tire tag disposed inside of a vehicle tire, and further comprising:

a printed circuit board (PCB) disposed within the vehicle tire, the PCB including first antenna terminals, the sensor, the microprocessor, the memory, and the transmitter;

an antenna disposed in the vehicle tire and including second antenna terminals, the first and second antenna terminals being configured to electrically connect with each other to thereby electrically connect the antenna to the transmitter, the antenna being spaced from the PCB; and

potting material for encapsulating the PCB, the sensor, the microprocessor, the memory, the transmitter, and the antenna.

Claim 110 (Original) An electronic tire management system comprising:

a tire tag mounted in a tire and including:

a sensor for measuring one or more tire parameters;

a transmitter for transmitting data signals using frequency shift key (FSK) modulation, the data signals representing the measured tire parameters; and

a microprocessor, coupled to the sensor and the transmitter, for activating the sensor at a first periodic interval; and

a remotely located reader/transceiver (RT) for sending interrogation signals to the tire tag and receiving data signals from the tire tag, the RT transmitting the interrogation signals using amplitude shift key (ASK) modulation.

Claim 111 (Original) The system of claim 110, wherein the microprocessor activates the tag transmitter on a second periodic interval and sends data signals representing the measured tire parameters to a reader selected from the group consisting of a surveillance reader, a fixed gate reader, an on-board vehicle reader, and a portable reader.

Claim 112 (Original) The system of claim 110, wherein:

the ASK interrogation signals are transmitted to the tire tag at a first rate in Kbps; and

the FSK data signals are transmitted from the tire tag to the RT at a second rate higher than the first rate in Kbps.

Claim 113 (Original) The system of claim 112 wherein:

the first rate is about 7.5 Kbps; and

the second rate is about 60 Kbps.

Claim 114 (Original) A method for electronically monitoring tire parameters with a tire tag, the method comprising:

causing the tire tag to enter a deep sleep mode to conserve power; and

automatically and periodically awakening the tire tag to a search mode, measuring and storing the tire parameters on a first periodic basis, performing pre-discrimination on a second periodic basis to determine whether a transmission is likely a forward link packet from a remote reader/transceiver (RT) and, if not, returning to the deep sleep mode.

Claim 115 (Original) The method of claim 114, further including:

awakening to a lucid sleep mode to turn on a low-speed clock and sample a search mode counter; and

awakening to a search mode if the search mode counter equals zero.

Claim 116 (Original) The method of claim 114, further including:

automatically awakening the tire tag to an interrogation mode to determine whether the transmission is a valid forward link packet and, if so, responding to the valid forward link packet; and

returning the tire tag to the deep sleep mode when the interrogation mode is complete.

Claim 117 (Original) The method of claim 114, further including:

attaching the tire tag to a tire patch;

attaching the tire patch to an inner wall of a tire having opposing beads and a tire tread, the tire having first metal wires associated with at least one of the tire beads; and

positioning the tire patch on the inner tire wall sufficiently far from at least one of the beads and the tire tread to optimize tire tag transmission of RF signals through the tire and the amount of stress transferred to the tire tag from the tire.

Claim 118 (Original) The method of claim 117, further including positioning the tire patch about half way from at least one of the beads to the beginning of the tread.

Claim 119 (Original) The method of claim 117, wherein the first metal wires are circumferentially disposed in at least one of the tire beads.

Claim 120 (Original) The method of claim 119, wherein second metal wires are disposed in the tire that radially extend from one of the tire beads on one side of the tire to a second of the

beads on an opposing side of the tire, and wherein the spacing of the second metal wires is greater at the center of the tire tread than at the tire bead.

Claim 121 (Original) The method of claim 120, further including positioning the tire patch on the inner tire wall so as to optimize tire tag transmission of RF signals through the first and second metal wires.

Claim 122 (Cancelled)

Claim 123 (Original) A tire tag comprising:

a microprocessor programmed to:

measure the current hot pressure (P2) and the current hot temperature (T2); and

determine an equivalent cold pressure of a tire using P2 and T2.

Claim 124 (Original) The tire tag of claim 123, wherein the microprocessor is programmed to use the combined gas laws of Boyle and Charles to calculate the equivalent cold pressure of the tire from P2 and T2.

Claim 125 (Original) The tire tag of claim 123, wherein the microprocessor is programmed to use altitude pressure data to calculate a cold tire pressure based upon the elevation of the area where the tire tag is used.

Claim 126 (Original) The tire tag of claim 123, wherein the tire contains a liquid and the microprocessor is programmed to correct P2 to account for vapor pressure in the tire.

Claim 127 (Original) The tire tag of claim 126, wherein the microprocessor is programmed to determine the partial pressure of the liquid, and to subtract the partial pressure from P2.

Claim 128 (Original) The tire tag of claim 126, wherein the liquid is water.

Claim 129 (Original) The tire tag of claim 126, wherein the liquid is a commercial grade fluid.

Claim 130 (Original) An interrogator comprising:

a microprocessor programmed to:

receive the current hot pressure (P2) and the current hot temperature (T2) readings from a tag; and

determine an equivalent cold pressure of a tire using P2 and T2.

Claim 131 (Original) The interrogator of claim 130, wherein the microprocessor is programmed to use the combined gas laws of Boyle and Charles to calculate the equivalent cold pressure of the tire from P2 and T2.

Claim 132 (Original) The interrogator of claim 130, wherein the microprocessor is programmed to use altitude pressure data to calculate a cold tire pressure based upon the elevation of the area where the tire tag is used.

Claim 133 (Original) The interrogator of claim 130, wherein the tire contains a liquid and the microprocessor is programmed to correct P2 to account for vapor pressure in the tire.

Claim 134 (Original) The interrogator of claim 133, wherein the microprocessor is programmed to determine the partial pressure of the liquid, and to subtract the partial pressure from P2.

Claim 135 (Original) The interrogator of claim 133, wherein the liquid is water.

Claim 136 (Original) The interrogator of claim 133, wherein the liquid is a commercial grade fluid.

Claim 137 (Currently Amended) A system for measuring at least one tire parameter comprising:

a tire tag disposed in a vehicle tire;

a sensor forming a part of the tire tag and measuring at least one tire parameter on a first periodic basis;

~~a memory in the microprocessor for storing the at least one measured tire parameter;~~

a microprocessor in the tire tag for causing communication between the tire tag and a remote source;

a memory in the microprocessor for storing the at least one measured tire parameter;

a transmitter/receiver forming a part of the tire tag for communicating with the remote source and transmitting at least the last stored tire parameter to the remote source under control of the microprocessor;

the microprocessor causing the sensor to measure the at least one tire parameter independently of causing the transmitter/receiver to communication with the remote source; and

the microprocessor periodically partially awakening to determine, on a second periodic basis, if a received transmission is a valid interrogation signal and, if so, fully awakening and responding to the valid interrogation signal.

Claim 138 (Currently Amended) A system for measuring a vehicle parameter comprising:

a sensor for measuring the vehicle parameter and generating a data signal representing the measured parameter;

a microprocessor coupled to the sensor for activating the sensor on a first periodic basis to measure the vehicle parameter;

a memory in the microprocessor for storing the generated data signal representing the measured parameter;

a transmitter coupled to the microprocessor; and

a receiver coupled to the microprocessor, the microprocessor periodically partially awakening to determine, on a second periodic basis, if a received transmission is a possible interrogation signal and, if so, fully awakening ~~the tire tag~~ to an interrogation mode to determine if the interrogation signal is valid, and, if so, responding to the valid interrogation signal, via the transmitter, by at least transmitting the last stored measured vehicle parameter.

Claim 139 (Original) The system of claim 138, wherein the sensor, microprocessor, memory, transmitter, and receiver are housed in a tag disposed on a vehicle, the tag communicating with a remote device via a wireless protocol.

Claim 140 (Original) The system of claim 139, wherein the microprocessor determines if the interrogation signal is intended for this particular tag.

Claim 141 (Currently Amended) The system of claim 138, wherein the vehicle parameter includes ~~parameters include~~ vehicle/axle load(s), tire revolutions (mileage), exhaust emissions, oil pressure, battery charge, coolant levels, brake wear, transmission fluid level, power steering fluid level, brake fluid level, clutch fluid level, windshield wiper fluid level, and status of headlights and taillights.

Claim 142 (Currently Amended) A system for conserving battery life in a battery operated device comprising:

a receiver for receiving a transmission that includes a postamble; and

a microprocessor coupled to the receiver, the microprocessor periodically partially awakening to determine whether the transmission is likely a FLP by examining the postamble.

Claim 143 (Previously Presented) The system of claim 142, wherein the postamble is Manchester encoded.

Claim 144 (Previously Presented) The system of claim 142, wherein the postamble includes a predetermined number of transitions.

Claim 145 (Previously Presented) The system of claim 142, wherein the microprocessor determines whether the transmission is likely a FLP by determining if the transmission includes a predetermined number of transitions.

Claim 146 (Previously Presented) The system of claim 142, wherein the microprocessor is configured to collect data from a sensor.

Claim 147 (Previously Presented) The system of claim 142, wherein the battery operated device includes a transmitter.

Claim 148 (Previously Presented) The system of claim 147, wherein the postamble shortens the amount of time that the transmitter is ON.

Claim 149 (Previously Presented) The system of claim 147, wherein the postamble increases the amount of time between the FLP and a RLP sent from the battery operated device, allowing the battery operated device enough time to stabilize its transmitter on an appropriate return link channel.

Claim 150 (Previously Presented) The system of claim 147, wherein the transmitter is turned ON only in response to a valid FLP.

Claim 151 (Previously Presented) The system of claim 147, wherein the transmitter uses a successive approximation routine to obtain data from one device out of a plurality of devices.

Claim 152 (Previously Presented) The system of claim 142, wherein the battery operated device only responds to a valid FLP having a specific identification number associated with the device.

Claim 153 (Previously Presented) The system of claim 142, wherein the battery operated device includes a transmitter having a phase locked loop (PLL).

Claim 154 (Previously Presented) The system of claim 153, wherein the postamble increases the amount of time that the battery operated device has to obtain a PLL lock on an appropriate return link channel.

Claim 155 (Previously Presented) The system of claim 153, wherein the postamble shortens the amount of time that the PLL is ON.

Claim 156 (Previously Presented) The system of claim 153, wherein the PLL is turned ON only in response to a valid FLP.

Claim 157 (Previously Presented) The system of claim 153, wherein the microprocessor first examines a beginning portion of the FLP and, if that portion indicates that the transmission appears to be a valid FLP, turns on the PLL, and then reads the rest of the FLP to determine whether the FLP is valid.

Claim 158 (Previously Presented) The system of claim 157, wherein the battery operated device turns OFF the PLL if the FLP is invalid.

Claim 159 (Previously Presented) The system of claim 153, wherein the postamble reduces the amount of time the PLL is ON, thereby saving battery power when the battery operated device is not in the presence of a valid FLP.

Claim 160 (Previously Presented) The system of claim 153, wherein the postamble increases the amount of time between the FLP and a RLP from the battery operated device, allowing the battery operated device enough time to obtain a PLL lock on an appropriate return link channel.

Claim 161 (Previously Presented) The system of claim 142, wherein the battery operated device only responds to the transmission if it is a valid FLP.

Claim 162 (Previously Presented) The system of claim 142, wherein the postamble shortens the amount of time that the receiver is ON.

Claim 163 (Previously Presented) A system for conserving battery life in a battery operated device comprising:

a receiver for receiving a transmission that includes a postamble; and

a microprocessor coupled to the receiver, the microprocessor periodically partially awakening to determine whether the transmission is likely a FLP by turning ON the receiver only long enough to determine if the transmission includes a predetermined number of transitions.

Claim 164 (Previously Presented) The system of claim 163, wherein the microprocessor fully awakens to determine whether the transmission is a valid FLP by examining at least a portion of the FLP data.

Claim 165 (Previously Presented) The system of claim 163, wherein the postamble includes a stream of logical zeros.

Claim 166 (Previously Presented) The system of claim 163, wherein the postamble includes a stream of logical ones.

Claim 167 (Previously Presented) The system of claim 163, wherein the ostamble begins with a stream of logical zeros and ends with a logical one.

Claim 168 (Previously Presented) The system of claim 167, wherein the transition from logical zero to logical one signifies the end of the valid FLP.

Claim 169 (Previously Presented) The system of claim 163, wherein the postamble begins with a stream of logical ones and ends with a logical zero.

Claim 170 (Previously Presented) The system of claim 163, wherein the battery operated device includes a transmitter.

Claim 171 (Previously Presented) The system of claim 170, wherein the postamble increases the amount of time between the FLP and a RLP from the battery operated device, allowing the battery operated device enough time to stabilize its transmitter on an appropriate return link channel.

Claim 172 (Previously Presented) The system of claim 170, wherein the transmitter is turned ON only in response to a valid FLP.

Claim 173 (Previously Presented) The system of claim 163, wherein the battery operated device includes a transmitter having a phase locked loop (PLL).

Claim 174 (Previously Presented) The system of claim 173, wherein the postamble increases the amount of time that the battery operated device has to obtain a PLL lock on an appropriate return link channel.

Claim 175 (Previously Presented) The system of claim 173, wherein the postamble shortens the amount of time that the PLL is ON.

Claim 176 (Previously Presented) The system of claim 173, wherein the microprocessor first examines a beginning portion of the FLP and, if that portion indicates that the transmission appears to be a valid FLP, turns on the PLL, and then reads the rest of the FLP to determine whether the FLP is valid.

Claim 177 (Previously Presented) The system of claim 176, wherein the battery operated device turns OFF the PLL if the FLP is invalid.

Claim 178 (Previously Presented) The system of claim 173, wherein the PLL is turned ON only in response to a valid FLP.

Claim 179 (Previously Presented) The system of claim 173, wherein the postamble reduces the amount of time the PLL is ON, thereby saving battery power when the battery operated device is not in the presence of a valid FLP.

Claim 180 (Previously Presented) The system of claim 173, wherein the postamble increases the amount of time between the FLP and a RLP from the battery operated device, allowing the battery operated device enough time to obtain a PLL lock on an appropriate return link channel.

Claim 181 (Previously Presented) The system of claim 163, wherein the postamble shortens the amount of time that the transmitter is ON.

Claim 182 (Previously Presented) The system of claim 163, wherein the battery operated device only responds to the transmission if it is a valid FLP.

Claim 183 (Previously Presented) The system of claim 163, wherein the postamble shortens the amount of time that the receiver is ON.

Claim 184 (Previously Presented) (New) The system of claim 163, wherein the FLP is Manchester encoded.

Claim 185 (Previously Presented) A method for conserving battery life in a battery operated device comprising:

receiving a wireless transmission;

periodically partially awakening; and

determining if the wireless transmission is likely a FLP by determining if the transmission includes a valid postamble.

Claim 186 (Previously Presented) The method of claim 185, wherein the postamble is valid if it includes a predetermined number of transitions.

Claim 187 (Previously Presented) The method of claim 185, further including fully awakening to determine whether the transmission is a valid FLP by examining at least a portion of the FLP data.

Claim 188 (Previously Presented) The method of claim 187, further including responding to the valid FLP via a transmitter.

Claim 189 (Previously Presented) The method of claim 185, wherein a valid postamble increases the amount of time between the FLP and a RLP sent from the battery operated device, allowing the battery operated device enough time to stabilize its transmitter on an appropriate return link channel.

Claim 190 (Previously Presented) The method of claim 185, wherein the battery operated device includes a transmitter having a phase locked loop (PLL).

Claim 191 (Previously Presented) The method of claim 190, wherein a valid postamble increases the amount of time that the battery operated device has to obtain a PLL lock on an appropriate return link channel.

Claim 192 (Previously Presented) The method of claim 190, wherein a valid postamble shortens the amount of time that the PLL is ON.

Claim 193 (Previously Presented) The method of claim 190, wherein a valid postamble reduces the amount of time the PLL is ON, thereby saving battery power when the battery operated device is not in the presence of a valid FLP.

Claim 194 (Previously Presented) (New) The method of claim 190, wherein a valid postamble increases the amount of time between the FLP and a RLP from the battery operated device, allowing the battery operated device enough time to obtain a PLL lock on an appropriate return link channel.

Claim 195 (Previously Presented) A method for conserving battery life in a battery operated device comprising:

targeting a specific device out of a plurality of devices;

transmitting a transmission that includes a postamble;

awakening to a first state to determine whether the transmission is likely a FLP by examining the postamble; and

awakening to a second state if the transmission is likely a FLP.

Claim 196 (Previously Presented) The method of claim 195, further including determining whether the FLP is valid.

Claim 197 (Previously Presented) The method of claim 196, further including responding to the valid FLP.